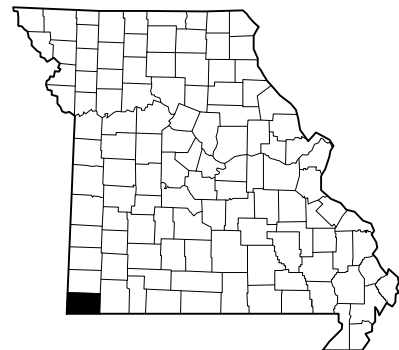


# BANK STABILIZATION

## BUFFALO CREEK AT PRICE RIDGE ROAD

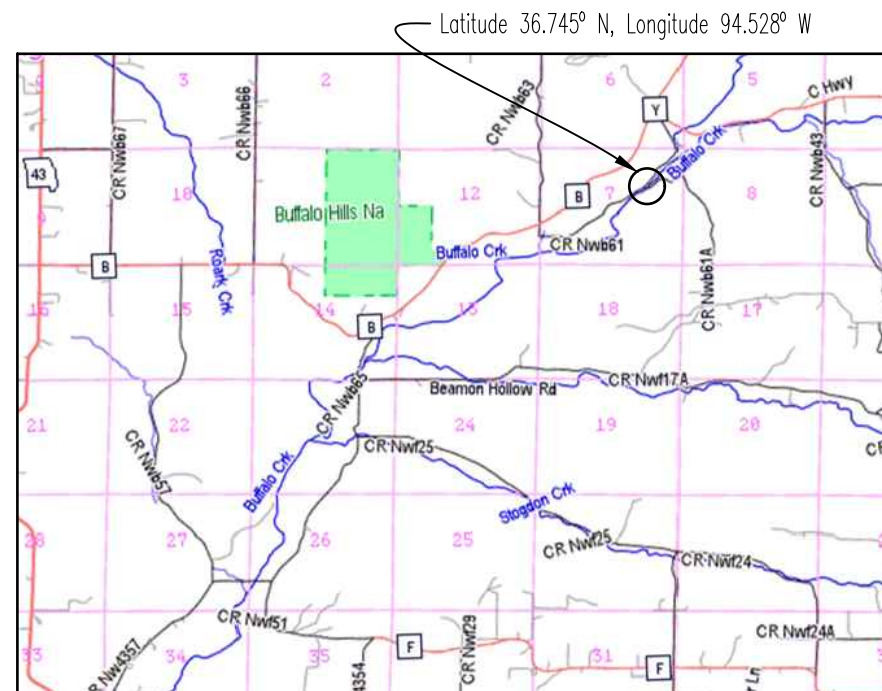
### MCDONALD COUNTY, MISSOURI

### MISSOURI NRCS EMERGENCY WATERSHED PROTECTION



McDonald County, Missouri

PROJECT LOCATION: NE ¼ of Section 7, Township 23N, Range 33W



#### ESTIMATED PROJECT QUANTITIES

| DESCRIPTION          | BASE DESIGN |          |
|----------------------|-------------|----------|
|                      | LENGTH      | QUANTITY |
| Stone Toe Protection | 60 LF       | 70 TN*   |
| Rock Blanket         | 75 LF       | 280 TN*  |

\* Estimate based on 1.5 tons per cubic yard of placed and compacted rock

#### SHEET INDEX

- G-01: COVER SHEET
- G-02: ABBR., LEGEND, & SYMBOLS
- G-03: CONSTRUCTION NOTES
- C-01: PLANNED CONSTRUCTION

#### NOTES:

1. PERMITTING: All construction shall be completed in compliance with the conditions of the U.S. Army Corps of Engineers Little Rock District General Permit (GP) 41, Application #SWL-2008-00066, Issue Date: April 23, 2018 – Expiration Date: April 23, 2023. The contractor is required to maintain a copy of the permit onsite throughout the duration of the construction period.
2. EXCAVATION: Missouri law requires that any person making or beginning any excavation notify all underground facility owners/operators which may be affected by said excavation at least three but not more than ten working days in advance, except in the case of an emergency. A "working day" is everyday, except Saturday, Sunday, or a legally declared local, state or federal holiday. To make this notification and locate all utilities at the site or on ingress & egress roads prior to excavation, contact the Missouri One Call system and submit a locate request. The phone number for the Missouri One Call System is 800-344-7483 (1-800-DIG-RITE).
3. TRANSPORTATION: Prior to construction, the contractor shall provide a transportation plan to the McDonald County Commission delineating haul routes and intended dates of use. The contractor shall coordinate with the county road district to ensure haul routes and loads conform to tonnage limitations on local bridges.
4. TECHNICAL ASSISTANCE: The contact numbers for technical assistance concerning the plan set are as follows:
5. JOBSITE SAFETY: The contractor and all subcontractors shall perform work on the jobsite in compliance with applicable OSHA standards and abide by all local, state, and federal regulations. The contractor shall submit to the engineer a project Safety Plan (SP) for all work performed by the contractor and all subcontractors prior to commencement of work. The purpose of the SP is to encourage and enable all work to be performed in the safest possible manner and that all parties involved are aware of their individual responsibility for safety on the jobsite. The SP shall outline and detail for all workers, the specific procedures and actions necessary to respond to a jobsite emergency and the measures taken to communicate these requirements to all workers. The SP shall include a list of local emergency contacts including phone numbers. A copy of the emergency contact list shall be accessible to workers. In the case where there is no cellular or land line phone service at the jobsite, the SP shall identify how to reach the nearest available phone service.

Michael Malone, REI Civil Engineer, P.E. . . . . (417) 300-2705  
Keith Lindquist, McDonald County Presiding Commissioner . . . . . (417) 223-7530

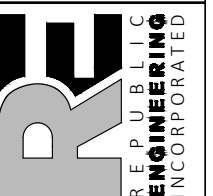


800-344-7483 (1-800-DIG-RITE)



#### COVER SHEET

BUFFALO CREEK AT PRICE RIDGE ROAD BANK STABILIZATION  
MCDONALD COUNTY COMMISSION  
MISSOURI NRCS EMERGENCY WATERSHED PROTECTION



SHEET IDENTIFICATION

**G-01**

SHEET 1 OF 4

| Description   | Date      |
|---------------|-----------|
| Investigated: | 04 JUN 18 |
| Surveyed:     | ---       |
| Designed:     | 18 JUL 18 |
| Drafted:      | 21 JUL 18 |
| Approved:     | 29 JUL 18 |

| ABBREVIATIONS |                                                        |
|---------------|--------------------------------------------------------|
| BM            | BENCHMARK                                              |
| C.C.          | CENTER TO CENTER                                       |
| CF            | CUBIC FEET                                             |
| CL            | CENTERLINE                                             |
| CLR           | CLEAR                                                  |
| CMP           | CORRUGATED METAL PIPE                                  |
| CY            | CUBIC YARD                                             |
| DC            | DEGREE OF CURVE                                        |
| DIA,          | DIAMETER                                               |
| E             | EAST                                                   |
| EA            | EACH                                                   |
| EL, ELEV      | ELEVATION                                              |
| FL            | FLOWLINE                                               |
| FT, '         | FOOT, FEET                                             |
| GA            | GAUGE                                                  |
| GALV          | GALVANIZED                                             |
| H, HORZ       | HORIZONTAL                                             |
| HDWL          | HEADWALL                                               |
| HWY           | HIGHWAY                                                |
| I.D.          | INSIDE DIAMETER                                        |
| IN, "         | INCH                                                   |
| LC            | LENGTH OF CURVE                                        |
| LT            | LEFT                                                   |
| MAX           | MAXIMUM                                                |
| MIN           | MINIMUM                                                |
| MODOT         | MISSOURI DEPARTMENT OF TRANSPORTATION                  |
| N             | NORTH                                                  |
| NAD           | NORTH AMERICAN DATUM                                   |
| NAVD          | NORTH AMERICAN VERTICAL DATUM                          |
| NTS           | NOT TO SCALE                                           |
| O.C.          | ON CENTER                                              |
| O.D.          | OUTSIDE DIAMETER                                       |
| PC            | POINT OF CURVATURE                                     |
| PI            | POINT OF INTERSECTION                                  |
| PSI           | POUNDS PER SQUARE INCH                                 |
| PVMT          | PAVEMENT                                               |
| R             | RADIUS                                                 |
| RC            | RADIUS OF CURVE                                        |
| RCP           | REINFORCED CONCRETE PIPE                               |
| ROW, RW       | RIGHT OF WAY                                           |
| RT            | RIGHT                                                  |
| S             | SOUTH                                                  |
| STA           | STATION                                                |
| STL           | STEEL                                                  |
| TEMP          | TEMPORARY                                              |
| TN            | TON                                                    |
| TYP           | TYPICAL                                                |
| UNK           | UNKNOWN                                                |
| V, VERT       | VERTICAL                                               |
| VC            | VERTICAL CURVE                                         |
| VPC, VPI, VPT | VERTICAL POINT OF CURVATURE, INTERSECTION, OR TANGENCY |
| W             | WEST                                                   |
| XING          | CROSSING                                               |

| LEGEND |                                               |
|--------|-----------------------------------------------|
|        | SPOT ELEVATION                                |
|        | VERTICAL/HORIZONTAL CONTROL POINT             |
|        | EXISTING MAJOR CONTOUR                        |
|        | EXISTING MINOR CONTOUR                        |
|        | PLANNED MAJOR CONTOUR                         |
|        | PLANNED MINOR CONTOUR                         |
|        | EXISTING TREES                                |
|        | EXISTING TREE LINE                            |
|        | EXISTING FENCE                                |
|        | PLANNED FENCE                                 |
|        | EXISTING PIPE CULVERT (OPENING DIAMETER)      |
|        | EXISTING BOX CULVERT (OPENING WIDTH X HEIGHT) |
|        | EXISTING UTILITY POLE                         |
|        | EXISTING UNDERGROUND UTILITY MARKER           |
|        | ROCK RIPRAP                                   |
|        | ONSITE EXCAVATED SPOIL                        |
|        | MULCH                                         |
|        | GRAVEL                                        |
|        | STABLE BASE                                   |
|        | EXISTING GROUNDLINE                           |
|        | CENTERLINE                                    |
|        | DEPRESSION                                    |
|        | ROCK BLUFF                                    |
|        | APPROXIMATE FLOWLINE OR RIVER THALWEG         |
|        | HIDDEN                                        |
|        | NORTH INDICATOR                               |

| SYMBOLS |                        |
|---------|------------------------|
|         | SECTION LETTER         |
|         | SHEET SECTION IS SHOWN |
|         | SECTION LETTER         |
|         | SHEET SECTION IS FROM  |
|         | DETAIL NUMBER          |
|         | SHEET SECTION IS SHOWN |
|         | DETAIL NUMBER          |
|         | SHEET DETAIL IS FROM   |
|         |                        |
|         |                        |

| Description                                          | Date                    |
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|                                                      | Investigated: 04 JUN 18 |
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|                                                      | Designed: 18 JUL 18     |
|                                                      | Drafted: 21 JUL 18      |
|                                                      | Approved: 29 JUL 18     |
| ABBREVIATIONS, LEGEND, & SYMBOLS                     |                         |
| BUFFALO CREEK AT PRICE RIDGE ROAD BANK STABILIZATION |                         |
| MCDONALD COUNTY COMMISSION                           |                         |
| MISSOURI NRCS EMERGENCY WATERSHED PROTECTION         |                         |
|                                                      |                         |
| SHEET IDENTIFICATION                                 |                         |
| G-02                                                 |                         |
| SHEET 2 OF 4                                         |                         |

ROCK RIPRAP MATERIAL SOURCE AND SELECTION:

1.

Rock riprap shall be obtained from a MoDOT approved source for bulk rock aggregate, and consist of individual rock fragments that are dense, sound, and free from cracks, seams, and other defects conducive to accelerated weathering. Rock fragments shall be angular to subrounded, with the least dimension of an individual rock fragment not less than one-third the greatest dimension of the fragment.
2.

Unless otherwise specified, rock riprap shall have a gradation in accordance with MoDOT material specification #609.60.2.4, Type 4 Rock Ditch Liner, consisting of material with a predominant rock size of 19 inches (475 mm), a maximum rock size of 28 inches (700 mm) and a gradation such that no more than 15 percent will be less than 6 inches (150 mm).
3.

Rock riprap will consist of clean, uncontaminated materials free from dirt, clay, sand, rock fines and other materials not meeting the required gradation limits to minimize excessive turbidity by leaching of fines, as well as to preclude the entrance of deleterious and/or toxic materials into the waters of the United States by natural runoff or by leaching.
4.

Prior to construction, the Contractor shall provide a representative gradation pile of rock at the project location for inspection and approval by the project engineer. The size of the gradation pile shall be a minimum of two (2) tons. The Contractor shall provide documentation from the quarry as to the quality (bulk specific gravity, absorption, soundness) of the source material. Only those materials approved by the engineer shall be used in construction.

ROCK RIPRAP SUBGRADE PREPARATION:

1.

The subgrade surfaces on which the rock riprap is to be placed shall be cut or filled and graded to the lines and grades shown on the drawings. Subgrade surfaces shall be reasonably smooth, the condition and depths of which documented by field notes, photograph, or similar method prior to rock placement.
2.

During construction, excess spoil will be stockpiled away from concentrated flow areas. After major construction operations are completed, excess spoil shall be spread uniformly in designated areas and along the toe of rock riprap erosion control measures.
3.

The rock riprap shall be placed by equipment on subgrade surfaces to the depths specified and shall be constructed to the full course thickness in one operation in such a manner as to avoid serious displacement of the underlying materials. Larger rock shall be placed at the toe of the rock protection measures to form a stable base.
4.

Rock shall be placed in a manner that will ensure that the installed measures are reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another with the smaller rocks and spalls filling the voids between the larger rocks. All placed rock riprap shall require mechanical compaction efforts to enhance in-place consolidation that reduces the susceptibility of rock movement during future flood events.

ROCK STABILIZATION DESCRIPTION:

1.

Rock Blanket shall be a minimum of thirty (30) inches thick when measured perpendicular to the slope. The slope shall be no steeper than 2.0 H to 1.0 V unless otherwise noted. The blanket shall be anchored at the base by a bench that is five (4) four feet wide and four (4) feet tall with an angle of repose no steeper than 1:1 as shown.
2.

LPSTP shall be comprised of consolidated rock that is four (4) feet wide at the crest, and four (4) feet tall with an angle of repose no steeper than 1:1. This stabilization measure shall be placed with sufficient density to require approximately 1.2 tons of rock per linear foot to construct.
3.

Assumed rock weight to volume conversion is 1.5 TN to 1.0 CY. Refer to cross-section details listed on Plate C-01 for additional information on rock stabilization dimensions.

EROSION CONTROL MEASURES:

1.

Prior to commencement of work, the contractor shall submit to the engineer an erosion control plan for all phases of work performed by the contractor and all subcontractors.
2.

Any excavation and/or moving of soil materials shall be scheduled to minimize the size of areas disturbed and unprotected from erosion for the shortest reasonable time. All stripping, clearing, grubbing and earthwork activities will be staged to ensure no greater than 1/2 acre is disturbed at any one time.
3.

For disturbed areas above the normal highwater mark of the watercourse, seeding and mulching shall be conducted as soon as reasonably possible following completion of that earthwork activity to provide protection of exposed soil surfaces from erosion in accordance with GP-41 Special Condition #13. Separate topsoil from all on-site excavate. Use separated topsoil as a final cover over disturbed and low bank areas to provide a sufficient substrate for seed.
4.

In-stream diversions and sediment basins constructed to divert water or treat water from the work areas are temporary and shall be removed and restored to the near original condition when they are no longer required to enable major construction operations.
5.

Sediment filters consisting of straw bales or geotextile sediment fences to trap sediment from runoff into waters of the U.S. shall be sufficiently anchored to prevent subsequent undermining or flanking. These erosion control measures shall be removed once major construction operations are complete.

PRESERVATION AND MANAGEMENT OF WOODY VEGETATION:

1.

Trees and other vegetation designated to remain undisturbed shall be protected from damage throughout the duration of the construction period as supported by GP-41 Special Condition #12. Any damages resulting from the contractor's operations or neglect shall be repaired by the contractor.
2.

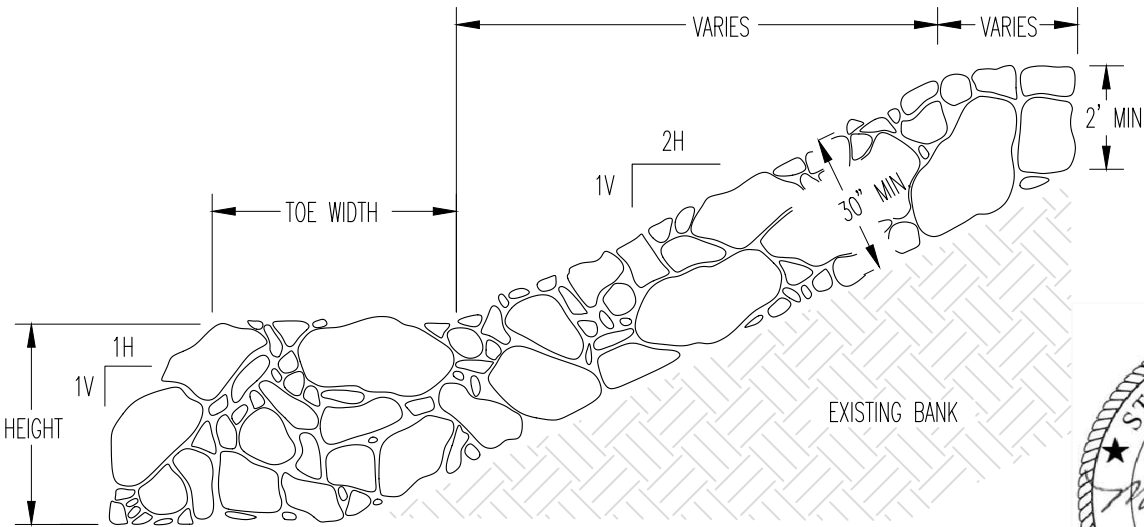
Any cleared vegetation or in-channel post-flood vegetative debris (trees, logs, brush) that must be removed to enable placement of stabilization works shall relocated as indicated in the plans or disposed in an approved location away from the project site.

ACCESS AND EGRESS:

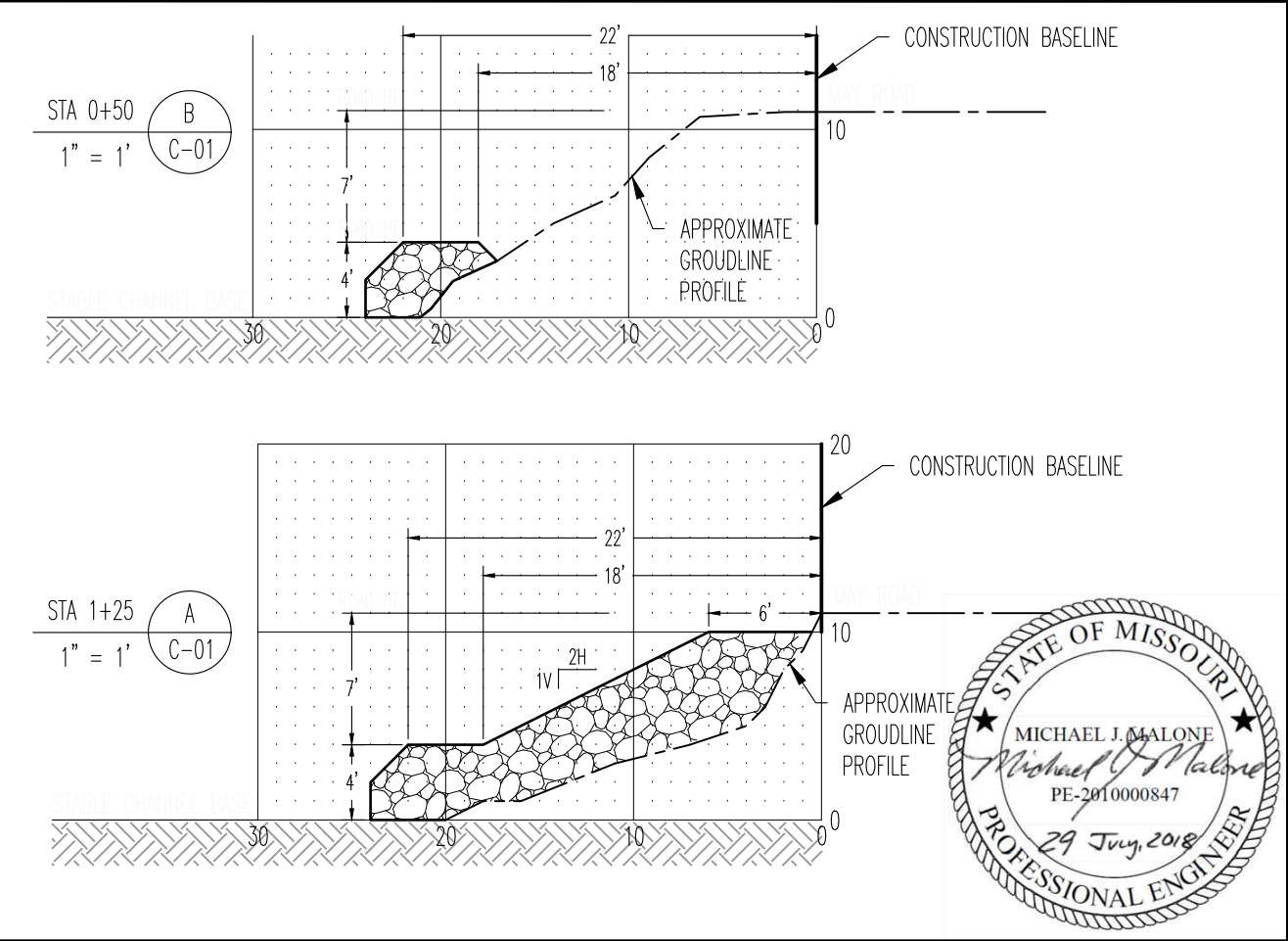
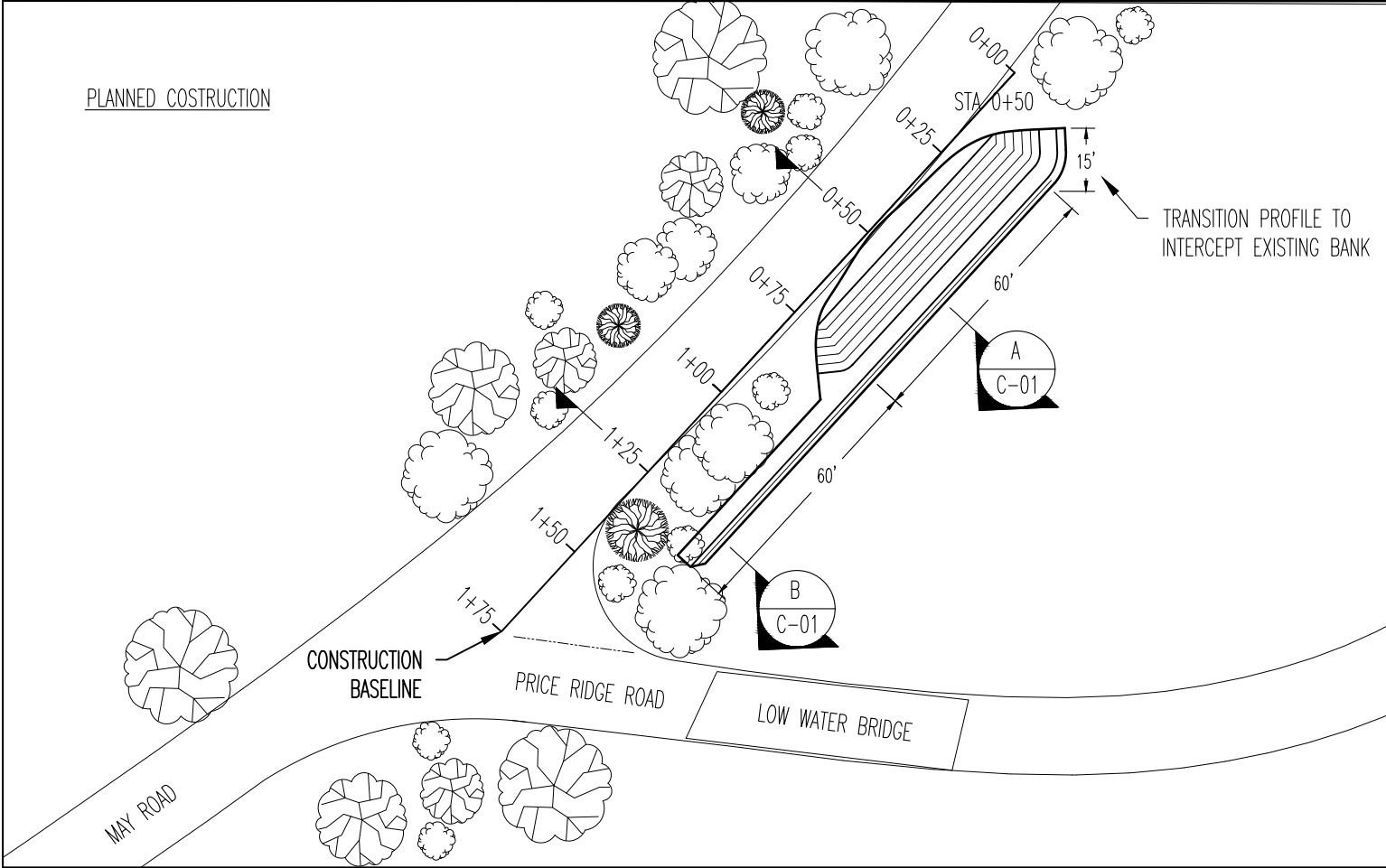
1.

The contractor shall provide a plan of equipment ingress/egress as well as equipment staging areas within the work limits to the McDonald County Commission prior to mobilization to the site to minimize disturbances to adjacent businesses and private residences.
2.

The contractor shall, at his/her own expense, remove and replace all fences, posts, culverts, street signs, and the like as required within the work limits as shown on Plate C-01.



| Description                                          | Date          |           |
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|                                                      | Drafted:      | 21 JUL 18 |
| Approved:                                            |               | 29 JUL 18 |
| CONSTRUCTION NOTES                                   |               |           |
| BUFFALO CREEK AT PRICE RIDGE ROAD BANK STABILIZATION |               |           |
| MCDONALD COUNTY COMMISSION                           |               |           |
| MISSOURI NRCS EMERGENCY WATERSHED PROTECTION         |               |           |
|                                                      |               |           |
| SHEET IDENTIFICATION                                 |               |           |
| G-03                                                 |               |           |
| SHEET 3 OF 4                                         |               |           |



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|---------------|-----------|
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**PLANNED CONSTRUCTION**

**BUFFALO CREEK AT PRICE RIDGE ROAD BANK STABILIZATION**

**MCDONALD COUNTY COMMISSION**

**MISSOURI NRCS EMERGENCY WATERSHED PROTECTION**

**RE**

REGISTERED PROFESSIONAL ENGINEER

MICHAEL J. MALONE

PE-2010000847

29 July, 2018

SHEET IDENTIFICATION

**C-01**

SHEET 4 OF 4